



HEATER



smartrenew



Northern Periphery and
Arctic Programme

2014–2020



EUROPEAN UNION

Investing in your future
European Regional Development Fund

SMARTrenew: Smarter Renewable Energy and Heating Management for Arctic and Northern Rural Territories

Lead Partner: Dr. Nick Timmons, Academic Director, WiSAR Lab, LyIT

Funder: Interreg NPA

Value: €1,65 million

Duration: 3 years, start date Oct 2018

End Date: March, 2022 **but continues as part of NPA HEATER Cluster project until June 2022**

Partner Counties and Organisations:

- ▶ Ireland; WiSAR Lab, LYIT
- ▶ Ireland; Donegal County Council
- ▶ N. Ireland; Derry City & Strabane District Council
- ▶ Finland; Oulu University of Applied Sciences
- ▶ Norway; Sinter Narvik Research Centre
- ▶ Iceland; Energy Agency
- ▶ Faroe Islands; Environment Agency



SMARTrenew in Alkureyri Iceland (just before lockdown)



SMARTrenew Results:

The main results will be:

- (i) greater awareness in communities and local authorities;
- (ii) renewable energy implementations that will show that local energy poverty can be decreased, and energy security increased.
 - ▶ 1 NPA transnational network of 7 partner organisations from 6 NPA countries
 - ▶ 1 transnational Directory of Services and Solutions online targeted at the whole NPA territory
 - ▶ 6 pilots implemented across the network
 - ▶ 18 houses and public buildings retrofitted with smart renewable energy and storage solutions,
 - ▶ 1 smart storage service
 - ▶ 1 renewable service
 - ▶ 6 Smarter Energy Rural Communities

Donegal County Council Pilot



Milford Public Services Centre & Community Library

Peadar Espey
Donegal County Council

Pilot Location



Est. Annual Savings Generated by SMARTrenew Project			
Project Element	[kWh]	[€]	[tCO2]
Air Source Heat Pumps	184,262	€8,680	34.2
Solar PV Array	4,901	€882	1.7
Fabric Upgrades	11,399	€969	2.9



Oil Tank Removal



PV Installation



Contract Award



Pump Controls to BMS



Air Source Heat Pumps

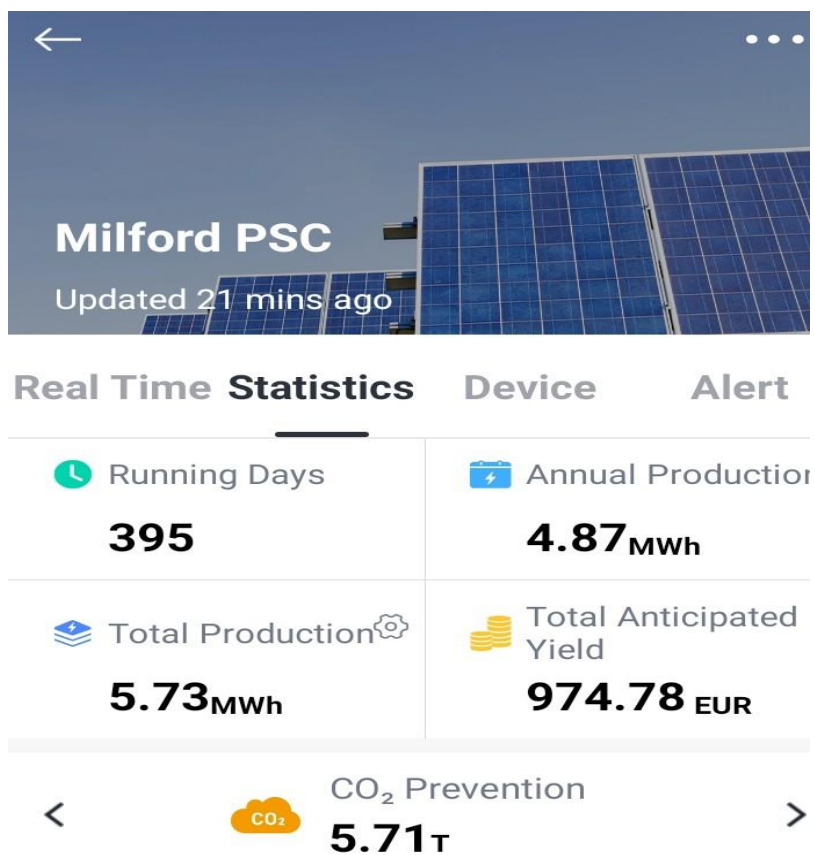


Fabric Upgrades - Cavity Insulation

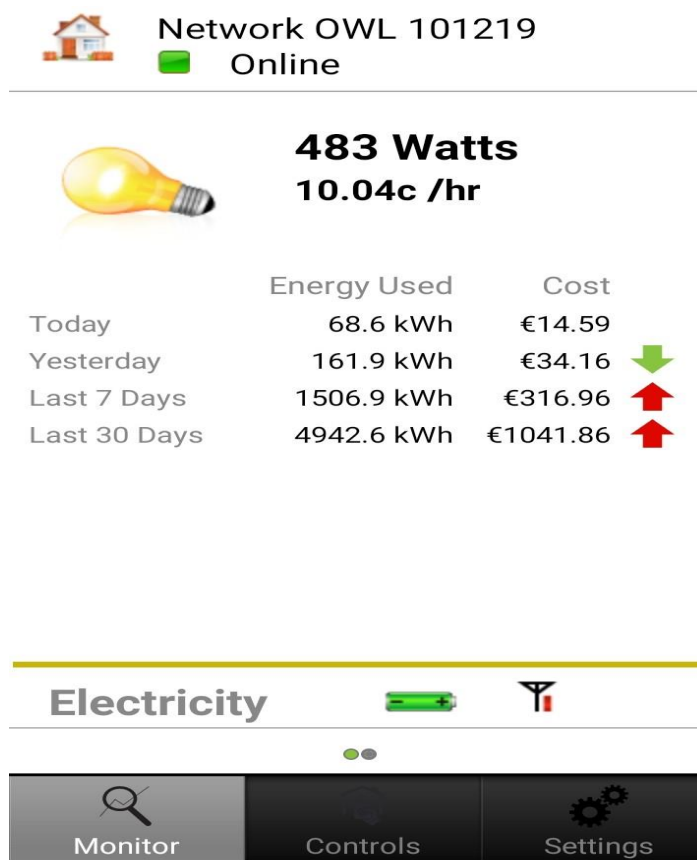


Fabric Upgrades - Cavity Insulation

Smart Technologies



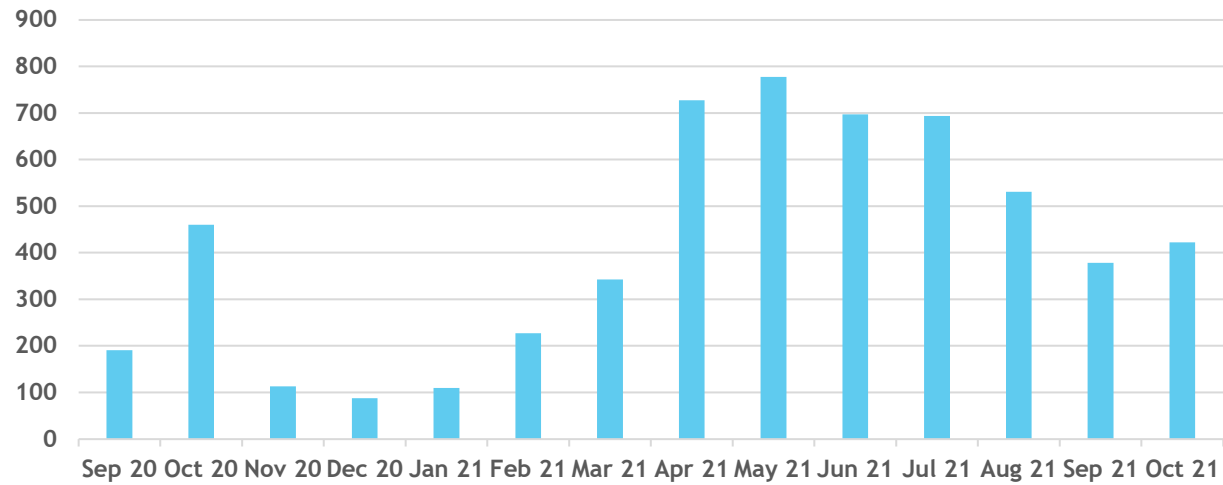
Solar PV - Smart Phone App



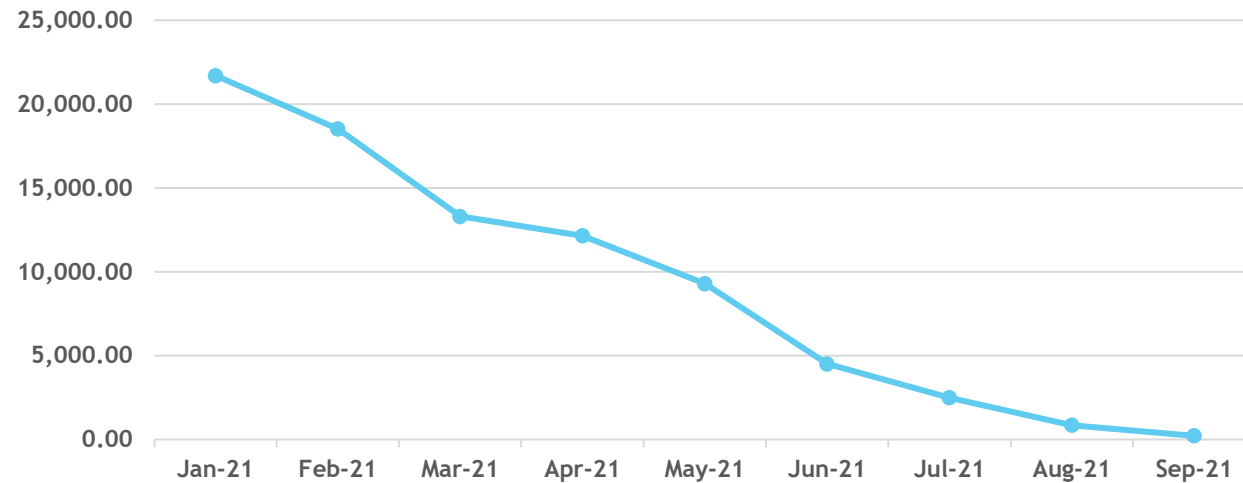
ASHP's – CT Meter Phone App



Milford PSC - PV Generation kWh 5,758



Milford PSC - ASHP's Consumption kWh





Pilot - Intelligent Energy Management Harbour House

Leo Strawbridge
Derry City and Strabane District Council



Reducing heating usage by **30%** using innovative wireless heating controls (verified by UUU's Centre for Sustainable Technologies)



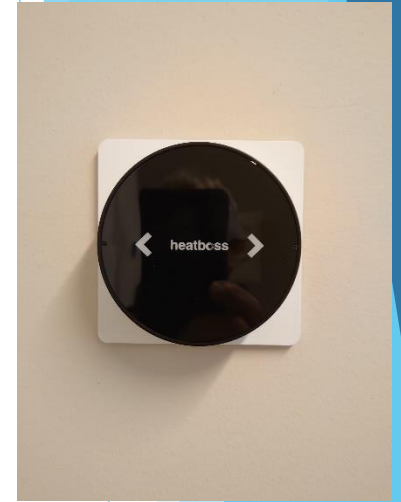
Founded and run from Co. Antrim with all design, development, testing and manufacture of software and electronics done locally.



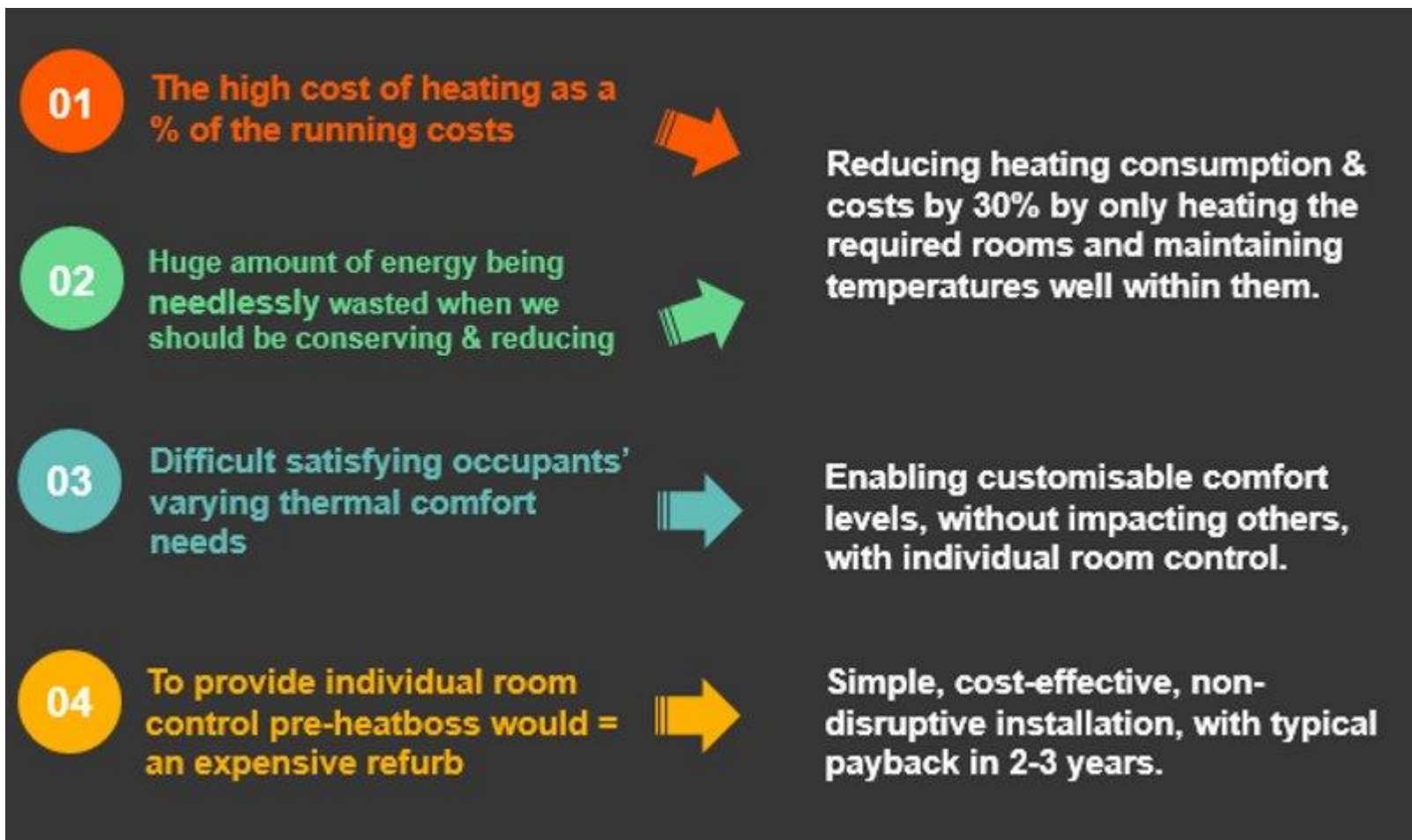
- Harbour House old heritage DCSDC building
- Retrofitted with several Wi-Fi enabled devices to allow for effective control of the buildings heating system.
- Each of the radiators have been fitted with a wireless radiator valve so that the heat of the radiators can be turned off and on when required.
- Each of the rooms have been fitted with an interactive thermostat
- Boiler controls have been fitted to allow for the Heatboss Wi-Fi hub to interact with the boiler when there is a demand for heat within the building.
- Each of the fitted devices allow for staff to control the heating with use of the thermostats or the interactive web app when required.
- The Wi-Fi enabled thermostats collect the temperature data for each room and send this to the interactive web app so that it is displayed live



- The smart controls link in with the buildings BMS (Building Management System)
- Staff can control the heat in each room by either using the Wi-Fi enabled thermostat
- or via a heating schedule which is setup through an interactive web based app. The Heating schedules allow for rooms to be heated when scheduled for use.
- Outside of scheduled heating times, the thermostats can be used to boost the temperature in a room when required. The Wi-Fi enabled thermostats collect the temperature data for each room and send this to the interactive web app so that it is displayed live



Challenges Addressed



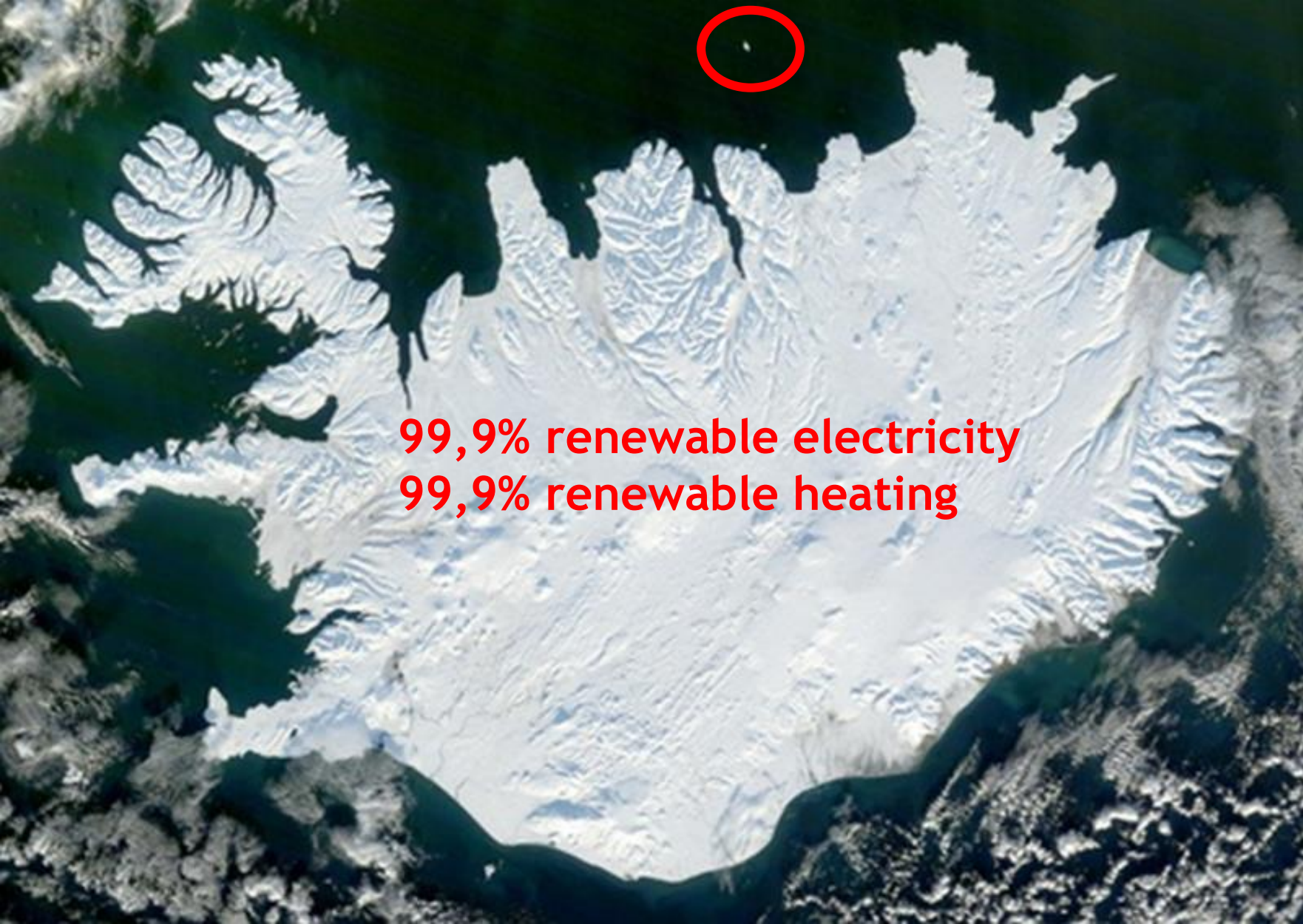


Iceland

Grímsey Pilot project

SIGURÐUR FRÍÐLEIFSSON,
RAGNAR ÁSMUNDSSON,
ENERGY AGENCY ICELAND





99,9% renewable electricity
99,9% renewable heating



Diesel use for heating ca 200.000 L
Diesel use for electricity ca 250.000 L



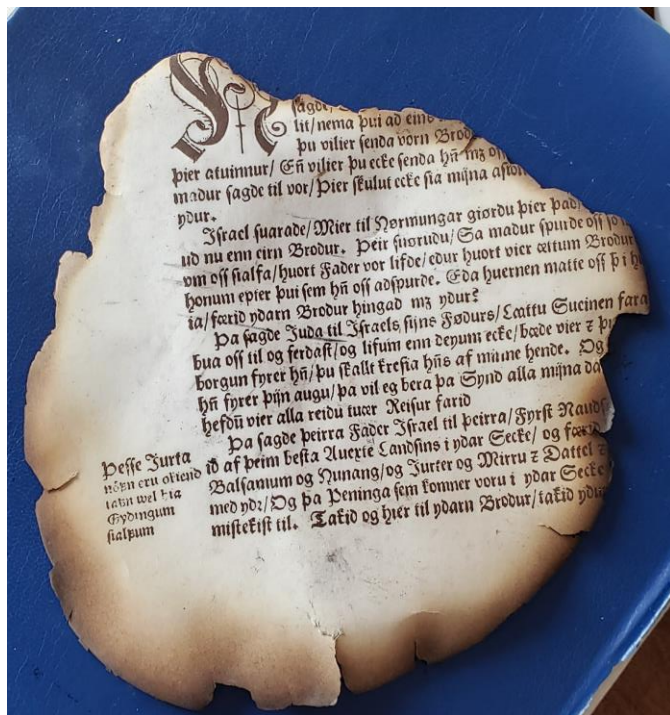
Milestones so far

- ▶ Changing regulations to fit renewable energy into the specific agreements between the state and the Energy producer on the island
- ▶ Introduce the plans to the residents
- ▶ Getting complicated permits for construction
- ▶ Finish the LED installation with the municipality
- ▶ Buy and ship the equipment to Grimsey
- ▶ Make agreement with an energy company to run and serve the units



Next steps beyond Smartrenew

- ▶ Add at least 4 more turbines
- ▶ Offer the residents solar panels on their properties
- ▶ Install battery to stabilise the grid
- ▶ Blend the diesel with locally produced biodiesel
- ▶ Install pellet burners and heat pumps
- ▶ Take out oil heating and subsidies



Thank you



All Partner Pilots



SIGURÐUR FRÍÐLEIFSSON, RAGNAR ÁSMUNDSSON, ENERGY AGENCY ICELAND

Pilot: Conversion renewable mix of wind, solar, biomass, and battery storage in Grimsey Island, Iceland

SANNA HILTUNEN, OULU UNIVERSITY OF APPLIED SCIENCES, FINLAND

Pilot: Smart heat storage combined with district heating to reduce oil use in Kuusamo, Finland & introduction to the SMARTrenew Hydrogen Working Group

PEADAR ESPEY, DONEGAL COUNTY COUNCIL

Pilot: Retrofit of existing public buildings in Northwest Ireland with pumped insulation, solar array, and air-to-water heat pumps

BJARTI THOMSEN, UMHVØRVISSTOVAN (ENVIRONMENT AGENCY), FAROE ISLANDS

Pilot: Borehole thermal energy storage combined with water storage in the Faroe Islands

LEO STRAWBRIDGE, DERRY CITY & STRABANE DISTRICT COUNCIL

Pilot: Retrofit of existing public buildings in Northern Ireland with HEATBOSS intelligent wireless heat management system

ØYSTEIN KLEVEN, SINTEF RESEARCH INSTITUTE, NORWAY

Pilot: Remote monitoring of solar, wind, temperature, and energy consumption, to reach an off-grid solution utilising a mix of renewable in technologies Norway

DR NICK TIMMONS, WiSAR Lab, LETTERKENNY INSTITUTE OF TECHNOLOGY

Pilot: Solar array with battery storage and grid back-up to power EV slow charging stations in Northwest Ireland



Thank you

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<https://smartrenew.interreg-npa.eu/>

